

polymorphism an immunoelectrophoresis method hardly used these days is described in detail. Furthermore, no example is provided to screen those proteins which are present at low abundance in serum although they could be analyzed by a combination of IEF and immunoblotting techniques. Chapter 10 describes conventional electrophoretic techniques and gives the population allele frequency distributions of nine commonly sampled polymorphic red cell enzymes. Although the IEF patterns of PGM1 phenotypes are presented, the IEF method is not described at all.

Chapter 11 describes the methods of DNA isolation and quantitation and the digestion of DNA with restriction enzymes followed by Southern blotting. Although the chapter is titled "DNA polymorphisms," no example of any DNA polymorphism is provided. It is disturbing to note that although PCR is considered to be the state-of-the-art technique for screening DNA polymorphism today, it is not discussed at all. Chapter 12, devoted to the description of four genetic traits which are not detectable in human blood, is out of place here because the pri-

mary focus of this book is on blood markers. The final chapter describes and illustrates examples of statistical analyses to calculate allele frequencies, heterozygosity, and genetic distance.

Overall, this book falls well short of covering the state-of-the-art techniques which presently are routinely used in the detection and screening of genetic variation in human blood, and therefore it will not find a wide use in a modern laboratory. Its exclusion of the state-of-the-art techniques and its emphasis of gene frequency data from Indian populations suggest that it was not meant for a global readership. However, this book may be useful for those still using conventional methods, without the means and resources to equip their laboratories with contemporary molecular technology. Its relatively high cost is problematic.

M. ILYAS KAMBOH

*Department of Human Genetics
Graduate School of Public Health
University of Pittsburgh
Pittsburgh, Pennsylvania*

IN QUEST OF THE SACRED BABOON: A SCIENTIST'S JOURNEY. By Hans Kummer. Princeton, NJ: Princeton University Press. 1995. 337 pp. ISBN 0-691-03071-9. \$29.95 (cloth).

Sir Solly Zuckerman's studies of the hamadryas baboons of London Zoo in the 1930s heralded the beginning of modern primatology. Because of their extravagant behaviors, he argued that sexuality formed the basis of primate sociality. Twenty-five years later, Hans Kummer, equally captivated by the hamadryas baboons at the Zurich Zoo, began to characterize features of hamadryas society that distinguish it from that of its African savannah relatives. This, his third book on primates and second on the hamadryas baboons of Ethiopia, summarizes material formerly presented in scholarly papers, enlivening it with his journal entries

and narrative observations from the field. The intended audience is wide, asking only that one be drawn by love of nature and exploration.

How could one not be fascinated by hamadryas baboons? Inhabitants of serene and extreme landscapes, the physical beauty of these animals and their surroundings rivets one's attention. But it is the complexity of their multileveled social organization, its response to the exigencies of dispersed and sparse resources, and its domination by male-male interactions, alliances, and contests which truly captivates. The successful hamadryas male, shepherding his female harem and their juvenile and infant dependents across sheer volcanic cliffs to their night-time roosts, has come to this lucky state by negotiating a wide variety of social roles that encompass deference, subterfuge, maternal behavior, competition and, occa-

sionally, outright aggression. The dissection of these behaviors, their ontogenies, the different male and female trajectories, and the evolution of hamadryas society is the subject matter of this book.

Of the 11 chapters, five present the majority of what is known about hamadryas behavior and its many contrasts with "savannah" baboon behavior, including the nature and ontogeny of hamadryas social relationships, alliances, life histories, and ecological adaptations. Both within- and cross-species comparisons are fruitfully drawn: Variation in behavior of hamadryas baboons from Ethiopia and Saudi Arabia shows that male behavior is indeed flexible, and the very different one-male units of geladas illuminate the variation in male and female roles within the same structural unit in closely related primate species.

One of Kummer's most important contributions has been his alternation between research in the laboratory and in the wild. The fertile interplay between these arenas is manifest in the contributions of the other principals of "Project Hamadryas"—whose research is also presented in the slow piecing together of an understanding of hamadryas society from experiment and observation. While there are few details in these chapters that will be novel to readers of the primatological literature, the value of the book lies rather in the panoramic view of life at the level of the individual and of the group.

The quest Kummer describes begins when he is still a graduate student in developmental biology, and continues to the late 1970s when research was abandoned in Ethiopia because of untenable political conditions. There is more than a little of the adventure story here—a young man driving his trusty vehicle west from the Red Sea port of Massawa to Addis Ababa, negotiating with officials from foreign cultures, braving nomads renowned for their art in battle and for their habits of separating their opponents from their testicles, enduring heat, malaria, wild animals, minor assaults, and mishaps. The book alternates between personal narrative, colorful travelogue, and masterly relating of laboratory and field observations and experimentation. From my own work in Ethiopia

and Awash, I recognize the places, the animals, and the contemporary human equivalents of the individuals who frequent his pages, and I find myself wincing in anguished recognition of scenes that 25 years later have been replayed in my experience! It is a vivid and accurate picture, but sadly dated are his descriptions of the then-abundant wildlife in the Awash National Park.

With much to admire, there are a few oddities that warrant comment. These occur mainly in the early chapters which draw least on areas of his expertise. I am bemused by his designation of hamadryas baboons as *Papio cynocephalus hamadryas*—nomenclature with few, if any, proponents, and which may fuel the endless wrangling about baboon taxonomy. Elsewhere he mistakenly describes mandrills as living in small groups comparable to terrestrial macaques. Some contestable (or presently unknowable) estimates are presented as facts, as in the statement that hamadryas and savanna baboons separated some 340,000 years ago, and more strangely yet, that "behavioral comparison gives preliminary evidence that separation (between the Arabian and Ethiopian hamadryas populations) . . . occurred only a few thousand years ago." How this behavioral clock is calibrated is never described. To make the social structures of hamadryas baboons more familiar to the lay reader, Kummer uses terms such as family, marriage, and the like, but this rationale seems empty to me, as relatively complex concepts are presented elsewhere. The meandering style—themes raised in one chapter, resurrected later in others, and narratives leaping from one decade to the next—makes establishing historical continuity, both in his research career as well as in the field studies of the hamadryas baboons, a bit of a challenge. The decades that encompass his research career have borne witness to major changes in behavioral biology—from the instinct-driven approach of his classical ethological training, through sociobiology, to contemporary studies of learning and cognition and a more measured integration of behavior and biology. Those interested in the history of primatology will find some meat here, but sometimes wish for a little more.

(I was surprised to learn that Kummer's highest degree was in developmental biology.)

Interwoven amongst the humorous recounting of anecdotes about the nomads and behavioral vignettes concerning hamadryas, gelada, and macaques is the shadow of his personal odyssey. By coming to know the baboons, Kummer has come to know himself. In a self-critical mode, he contemplates his own scientific interventions; describing experiments where he transplanted anubis baboons into hamadryas groups, he states "The outcome of these experiments makes me feel guilty even today . . . no one appreciated then the bonding of savannah females to their relatives. . . . It seems to me essen-

tial that the person . . . should have an inkling of the suffering she or he may cause."

I am struck by the breadth and achievements of his career. While "Project Hamadryas" has ended, its legacy lives on. Many of the questions he describes as remaining to be answered are currently being investigated by the Awash National Park Baboon Research Project. In addition to the evident scientific and personal satisfaction his quest has provided him, perhaps it is also of satisfaction to contemplate the work he has inspired and to anticipate the fruits it is yet to bear.

JANE PHILLIPS-CONROY

*Department of Anatomy and Neurobiology
Washington University School of Medicine
St. Louis, Missouri*

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